

## REMARKS

This paper is being filed in response to the Office Action mailed September 19, 2005. Claims 1, 8, 20, 27, 31, 34, 36 and 38 have been amended. Claims 42-45, corresponding to the originally filed claims 7, 9-10 and 24, have been added.

A check in the amount of \$50.00 for added dependent claims is enclosed. Authorization is granted to charge our deposit account no. 03-3415 for any additional fees necessary for entry of this Amendment.

The Examiner has allowed claims 40 and 41 and has found claims 15-18 and 29 to be allowable. The Examiner has rejected applicants' claims 1-3, 11-14, 19-22, 25, 26, 30-33 and 35-37 under 35 USC §103(a) as being unpatentable over the Chow, et al. (US 2003/0113598) patent application publication in view of the Wakita, et al. (6,579,347 patent). The Examiner has rejected applicants' claims 4-6, 8, 23, 27, 28, 34, 38 and 39 under 35 USC §103(a) as being unpatentable over the Chow, et al. publication in view of the Wakita, et al. patent and further in view of the Hanamoto, et al. (US 5,948,398) patent. Applicants have amended applicants' independent claims 1, 20, 31 and 36 and with respect to these claims, as amended, and their respective dependent claims, the Examiner's rejections are respectfully traversed.

Applicants have amended independent claim 1 to recite a fuel processing system for processing fuel for a fuel cell comprising a first adsorbent bed for adsorption of inorganic sulfur-containing compounds and high molecular weight organic sulfur-containing compounds, a second adsorbent bed for adsorption of low molecular weight organic sulfur-containing compounds, wherein the first and second adsorbent beds are arranged such that the fuel to be processed passes through one of the first and second adsorbent beds, and thereafter through the other of the first and second adsorbent beds, wherein the first and second adsorbent beds

operate at a temperature between 50 and 120°F and a pressure between 10 and 100 psig.

Applicants' independent claims 20, 31 and 36 have been similarly amended.

The constructions recited in applicants' independent claims 1, 20, 31 and 36 are not taught or suggested by the cited art of record. In particular, none of the references cited by the Examiner teach or suggest a fuel processing system or method wherein the first and second adsorbent beds operate at a temperature between 50 and 120°F and a pressure between 10 and 100 psig. Specifically, the Chow, et al. reference discloses a desulfurization unit having a first bed comprising zeolites, a second bed comprising a nickel adsorbent and a third bed comprising one or more of copper-zinc adsorbents, activated alumina, activated carbon and zeolites. See, Paragraphs [0042-0044]. In paragraph [0055], Chow, et al. discloses that the first bed, i.e. zinc oxide bed, operates at temperatures as high as 750°C (1382°F), the second bed, i.e. nickel adsorbent bed, has a temperature range of about 150°C to 300-400°C (302°F to 572-752°F), and the third bed, i.e. activated carbon, functions poorly at elevated temperatures. Paragraph [0074] of the Chow, et al. publication further discloses that the third bed comprising a copper-zinc adsorbent has a minimum operating temperature of about 5°C (41°F), whereas the zinc oxide and nickel adsorbent beds have typical operating temperatures in the range of about 150°C to about 300°C (302°F to 572°F). Further, in paragraph [0075], Chow, et al. discloses that the first and second beds may have the minimum operating temperature of 260°C (500°F) while the third bed has a minimum operating temperature of 20°C or less (68°F or less). Chow, et al. thus teaches that only one of the beds operates at a lower temperature, i.e. third bed at operating temperature of 68°F, while the other beds operate at high temperatures above 300°F. Therefore, there is no teaching or suggestion in the Chow, et al. publication of the first and second beds operating at a temperature between 50 and 120°F.

Moreover, the Chow, et al. publication makes no mention of the operating pressure in any of the first, second and third beds, and therefore Chow, et al. also fail to teach or suggest the first and second beds operating at a pressure between 10 and 100 psig.

The Wakita, et al. patent likewise fails to teach or suggest the first and second adsorbent beds operating at a temperature between 50 and 120°F and a pressure between 10 and 100 psig. Particularly, in column 5, line 65 to column 6, line 67, Wakita, et al. disclose adsorption tests performed on a plurality of adsorbents, wherein adsorption of each adsorbent placed in a sample tube was tested at atmospheric pressure (0 psig) and at adsorption temperature of 25°C (77°F). See also, col. 10, lines 30-44. The Wakita, et al. patent thus merely discloses testing of the adsorption performance of each adsorbent at room temperature and atmospheric pressure, and there is no teaching or suggestion in Wakita, et al. as to the temperature or pressure at which the first and second adsorbents operate. Accordingly, the Wakita, et al. patent also fails to teach or suggest the first and second beds operating at a temperature of 50 to 120°F and at a pressure of 10 to 100 psig.

The Hanamoto, et al. patent also does not teach or suggest these features. Hanamoto, et al. disclose a metal oxide-carrying activated carbon catalyst which is capable of removing foul-order substances of methylmercaptan and trimethylamine at a low temperature of 5°C (41°F), and adsorption tests performed on the catalysts at temperatures of 5°C (41°F) and 30°C (86°F). The Hanamoto, et al. patent does not mention the pressure at which the catalyst operates. Accordingly, there is no teaching in the Hanamoto, et al. patent of the first and second beds operating at temperatures of 50 to 120°F and pressures of 10 to 100 psig.

Moreover, the operating pressure ranges recited in applicants' amended independent claims 1, 20, 31 and 36 are not parameters that would be routinely optimized by one having

ordinary skill in the art at the time of the invention. In particular, the prior art of record does not teach or suggest operating the desulfurizer at an elevated pressure. Instead, the cited Wakita, et al. patent discloses testing of adsorbent samples at atmospheric pressure, while the other cited references make no mention of the operating pressure. Moreover, one having ordinary skill in the art at the time of the invention would not be motivated to use elevated pressures in the desulfurizer during its operation since increasing the operating pressure in the desulfurizer increases the operating costs of the system.

However, the operating pressure range recited in applicants' amended independent claims, together with the lower operating temperatures of 50 to 120°F, allows operation of the desulfurizer at elevated pressures without significantly increasing the operating costs of the system. In addition, the operation of the desulfurizer at pressures between 10 and 100 psig increases the adsorbent capacity of the desulfurizer for removal of sulfur-containing compounds, thus improving the performance of the desulfurizer.

Based on the above, applicants submit that the pressure range of 10 to 100 psig recited in applicants' amended independent claims 1, 20, 31 and 36 would not have been routinely optimized by one having ordinary skill in the art at the time of the invention, and that applicants' amended independent claims 1, 20, 31 and 36, and their respective dependent claims, thus patentably distinguish over the Chow, et al. publication, the Wakita, et al. patent and the Hanamoto, et al. patent, taken alone or in combination.

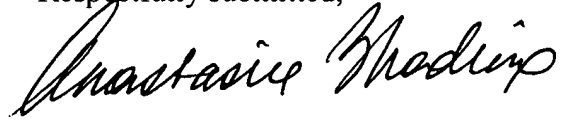
In view of the above, it is submitted that applicants' claims, as amended, patentably distinguish over the cited art of record. Accordingly, reconsideration of the claims is respectfully requested.

If the Examiner believes that an interview would expedite consideration of this Response or of the application, a request is made that the Examiner telephone applicants' counsel at (212) 790-9286.

Dated: December 13, 2005

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Respectfully submitted,

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